

What is claimed is:

1. A DNA fragment which encodes a *B. mallei* AHS protein.
2. The DNA fragment of claim 1, wherein said DNA fragment
5 is *bmaI3* comprising the sequence specified in SEQ ID NO:2 or
a sequence with 90% identity to *bmaI3*.
3. The DNA fragment of claim 1, wherein said DNA fragment is
bmaI1 comprising the sequence specified in SEQ ID NO:1, or
10 a. sequence with 90% identity to *bmaI1*.
4. A DNA fragment which encodes a *B. mallei* LuxR
transcriptional regulator gene.
- 15 5. The DNA fragment of claim 4 wherein said DNA fragment is
bmaR1 comprising the sequence specified in SEQ ID NO:3, or a
sequence with 90% identity to *bmaR1*.
6. The DNA fragment of claim 4 wherein said DNA fragment is
20 *bmaR3* comprising the sequence specified in SEQ ID NO:4, or a
sequence with 90% identity to *bmaR3*.
7. The DNA fragment of claim 4 wherein said DNA fragment is
bmaR4 comprising the sequence specified in SEQ ID NO:5, or a
25 sequence with 90% identity to *bmaR4*.
8. The DNA fragment of claim 4 wherein said DNA fragment is
bmaR5, said DNA fragment comprising the sequence specified
in SEQ ID NO:6, or a sequence with 90% identity to *bmaR5*.

9. A DNA fragment which encodes a *B. pseudomallei* AHS protein.

10. A DNA fragment of claim 9 wherein said fragment is *bpmI1*
5 comprising the sequence specified in SEQ ID NO:7, or a sequence with 90% identity to *bpmI1*.

11. A DNA fragment of claim 9 wherein said fragment is *bpmI2*, said DNA fragment comprising the sequence specified
10 in SEQ ID NO:8, or a sequence with 90% identity to *bpmI2*.

12. A DNA fragment of claim 9 wherein said fragment is *bpmI3*, said DNA fragment comprising the sequence specified
15 in SEQ ID NO:9, or a sequence with 90% identity to *bpmI3*.

13. A DNA fragment which encodes a *B. pseudomallei* LuxR transcriptional regulator.

14. A DNA fragment of claim 13 wherein said fragment is *bpmR1*, said DNA fragment comprising the sequence specified
20 in SEQ ID NO:10, or a sequence with 90% identity to *bpmR1*.

15. A DNA fragment of claim 13 wherein said fragment is *bpmR2*, said DNA fragment comprising the sequence specified
25 in SEQ ID NO:11, or a sequence with 90% identity to *bpmR2*.

16. A DNA fragment of claim 13 wherein said fragment is *bpmR3*, said DNA fragment comprising the sequence specified
30 in SEQ ID NO:12, or a sequence with 90% identity to *bpmR3*.

17. A DNA fragment of claim 13 wherein said fragment is *bpmR4*, said DNA fragment comprising the sequence specified in SEQ ID NO:13, or a sequence with 90% identity to *bpmR4*.

5 18. A DNA fragment of claim 13 wherein said fragment is *bpmR5*, said DNA fragment comprising the sequence specified in SEQ ID NO:14, or a sequence with 90% identity to *bpmR5*.

19. A recombinant DNA construct comprising:
10 (i) a vector, and
(ii) at least one of the *B.mallei* DNA fragments chosen from the group consisting of SEQ ID NO:1, 2, 3, 4, 5, and 6 or a sequence with 90% identity to said sequence.

15 20. A recombinant DNA construct comprising:
(i) a vector, and
(ii) at least one of the *B.pseudomallei* DNA fragments chosen from the group consisting of SEQ ID NO:7, 8, 9, 10, 11, 12, 13, and 14 or a sequence with 90% identity to said
20 sequence.

21. A recombinant DNA construct according to claim 19, wherein said vector is an expression vector.

25 22. A recombinant DNA construct according to claim 20, wherein said vector is an expression vector.

23. The recombinant DNA construct according to claim 21, wherein said vector is a prokaryotic vector.

30 24. The recombinant DNA construct according to claim 22, wherein said vector is a prokaryotic vector.

25. A host cell transformed with a recombinant DNA construct according to claim 20.

5 26. A host cell transformed with a recombinant DNA construct according to claim 21.

27. A host cell according to claim 25, wherein said cell is prokaryotic.

10 28. A host cell according to claim 26, wherein said cell is prokaryotic.

29. A host cell according to claim 25, wherein said cell is eukaryotic.

15 30. A host cell according to claim 26, wherein said cell is eukaryotic.

31. A method for producing a peptide which comprises
20 culturing the cells according to claim 25, under conditions such that said DNA fragment is expressed and said peptide is thereby produced.

32. A method for producing a peptide which comprises
25 culturing the cells according claim 26, under conditions such that said DNA fragment is expressed and said peptide is thereby produced.

33. An isolated recombinant *B.mallei* AHS peptide produced by
30 the method of claim 31.

34. An isolated recombinant *B.mallei* LuxR peptide transcriptional regulator produced by the method of claim 32.
- 5 35. An isolated recombinant *B. pseudomallei* AHS peptide produced by the method of claim 32.
36. An isolated recombinant *B. pseudomallei* LuxR transcriptional regulator peptide produced by the method of
10 claim 32.
37. An isolated and purified *B. mallei* AHS protein chosen from the group specified in SEQ ID NO:15 and 16 and conservative substitutions thereof.
- 15 38. An isolated and purified *B. mallei* LuxR transcriptional regulator protein chosen from the group specified in SEQ ID NO:17, 18, 19 and 20 and conservative substitutions thereof.
- 20 39. An isolated and purified *B. pseudomallei* AHS protein chosen from the group specified in SEQ ID NO:21, 22, and 23 and conservative substitutions thereof.
40. An isolated and purified *B. pseudomallei* LuxR
25 transcriptional regulator protein chosen from the group specified in SEQ ID NO:24, 25, 26, 27, and 28 and conservative substitutions thereof.
41. An antibody to a peptide encoded by a sequence chosen
30 from the group consisting of the sequences specified in SEQ ID NO:15, 16, 17, 18, 19, and 20.

42. An antibody to a peptide encoded by a sequence chosen from the group consisting of the sequences specified in SEQ ID NO:21, 22, 23, 24, 25, 26, 27, and 28.

5 43. A method for screening agents or drugs which reduce or eliminate *B. mallei* virulence said method comprising detecting a decrease BmaI3 enzyme activity in the presence of said agent or drug.

10 44. An agent or drug capable of inhibiting *B. mallei* BmaI3 enzyme activity.

45. A therapeutic compound comprising said agent or drug according to claim 45 for use in treatment of glanders
15 disease.

46. A method for detecting *bpmI2* in a sample using the polymerase chain reaction.

20 47. A diagnostic kit for detecting *bmaI3* RNA/cDNA in a sample comprising primers or oligonucleotides specific for *bmaI3* RNA or cDNA suitable for hybridization to *bmaI3* RNA or cDNA and amplification of *bmaI3* sequences and suitable ancillary reagents.

25 48. A therapeutic method for the treatment or amelioration of diseases resulting from *B. mallei*, said method comprising providing to an individual in need of such treatment an effective amount of an agent or drug which reduces or
30 eliminates BmaI3 expression or function in a pharmaceutically acceptable diluent.

49. A mutant *B.mallei* strain with reduced virulence wherein said strain is altered in expression or function of BmaI3.

50. An avirulent *B.mallei* strain devoid of BmaI3 activity.

5

51. A *B.mallei* vaccine strain comprising *B.mallei* having a non-revertant mutation in *bmaI3*, wherein said strain has reduced virulence and is devoid of BmaI3 activity.

10 52. The *B. mallei* vaccine strain of claim 51 wherein said strain further contains another non-revertant loss-of-function mutation in a gene chosen from the group consisting of *bmaI3*, *bmaI1*, and *bmaR5*.

15 53. A vaccine for glanders comprising *B.mallei* vaccine strain according to claim 51.

54. A vaccine for glanders comprising *B.mallei* vaccine strain according to claim 52.

20

55. A *B.pseudomallei* vaccine strain comprising *B.pseudomallei* having a non-revertant mutation in *bpmI3*, wherein said strain has reduced virulence and is devoid of BpmI3 activity.

25

56. The *B. pseudomallei* vaccine strain of claim 51 wherein said strain further contains another non-revertant loss-of-function mutation in a gene chosen from the group consisting of *bpmI3*, *bpmI1*, and *bpmR5*.

30

57. A vaccine for melioidosis comprising the *B.pseudomallei* vaccine strain according to claim 55.

58. A vaccine for melioidosis comprising *B.pseudomallei*
5 vaccine strain according to claim 56.

59. A vaccine for melioidosis comprising the *B.mallei* vaccine strain of claim 51.

10 60. A vaccine for melioidosis comprising the *B.mallei* vaccine strain of claim 52.

61. A method to elicit a *B.mallei* immune response in a mammal, said method comprising administering to said mammal
15 a composition comprising the *B.mallei* vaccine strain of claim 51.

62. An *Burkholderia* infection diagnostic kit comprising at least 12 consecutive nucleotides of any of SEQ ID NO:1-14
20 specific for the amplification of DNA or RNA of *Burkholderia* in a sample using the polymerase chain reaction and ancillary reagents suitable for use in such a reaction for detecting the presence or absence of *Burkholderia* DNA or RNA in a sample.

25

63. A method for distinguishing between *B. mallei* and *B. pseudomallei*, said method comprising detecting the presence of *bpmIR2*, wherein presence of *bpmIR2* indicates the presence of *B. pseudomallei*.

30